

ENVIRONMENTAL GEOSCIENCE - BS

The increasing demands that population growth and affluence put on the natural resources and the Earth's environment require greater numbers of trained professionals and informed citizens. The BS degree in Environmental Geosciences embraces all the disciplines of geosciences to give the student a rigorous interdisciplinary education including issues associated with environmental policy. The degree trains students for employment by industry, environmental and engineering consulting firms, non-governmental organizations, and governmental regulatory agencies, among other entities. Students focus coursework in a particular environmental theme: coastal and marine environments, water, human impact on the environment, climate change, or biosphere.

Program Requirements

First Year

Fall		Semester Credit Hours
CHEM 119	Fundamentals of Chemistry I	4
ENGL 104	Composition and Rhetoric	3
GEOS 101	Introduction to the Geosciences	0
GEOS 105	Introduction to Environmental Geoscience	3
MATH 151	Engineering Mathematics I	4
Semester Credit Hours		14
Spring		
CHEM 120	Fundamentals of Chemistry II	4
GEOS 205	Environmental Geosciences Cornerstone	1
MATH 152	Engineering Mathematics II	4
POLS 206	American National Government	3
Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts) ¹		3
Semester Credit Hours		15

Second Year

Fall		Semester Credit Hours
BIOL 111	Introductory Biology I	4
GEOG 201	Introduction to Human Geography	3
Select one of the following: ²		4
ATMO 201 & ATMO 202	Weather and Climate and Weather and Climate Laboratory	
GEOG 203 & GEOG 213	Planet Earth and Planet Earth Lab	
GEOL 101 & GEOL 102	Principles of Geology or Introduction to the Solid Earth	
or		
GEOL 150		
OCNG 251 & OCNG 252	Oceanography and Oceanography Laboratory	
Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture) ¹		3
Semester Credit Hours		14

Spring

BIOL 112	Introductory Biology II	4
POLS 207	State and Local Government	3
Select one of the following: ²		4
ATMO 201 & ATMO 202	Weather and Climate and Weather and Climate Laboratory	
GEOG 203 & GEOG 213	Planet Earth and Planet Earth Lab	
GEOL 101 & GEOL 102	Principles of Geology or Introduction to the Solid Earth	
or		
GEOL 150		
OCNG 251 & OCNG 252	Oceanography and Oceanography Laboratory	
Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication)		3

Semester Credit Hours

14

Third Year

Fall		Semester Credit Hours
GEOG 330	Resources and the Environment	3
STAT 303	Statistical Methods ³	3
or STAT 211	or Principles of Statistics I	
Select one of the following:		4
PHYS 201	College Physics ⁴	
PHYS 206 & PHYS 226	Newtonian Mechanics for Engineering and Science and Physics of Motion Laboratory for the Sciences	
Environmental theme elective ⁵		3
Technical elective ⁶		3
Semester Credit Hours		16

Spring

GEOG 390	Principles of Geographic Information Systems ⁷	4
GEOL 420	Environmental Geology	3
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)		3
Environmental theme elective ⁵		3
Environmental policy elective ⁸		3
Semester Credit Hours		16

Fourth Year

Fall		Semester Credit Hours
GEOS 470	Data Analysis Methods in Geosciences	4
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)		3
Environmental theme elective ⁵		6
Technical elective ⁶		3
Semester Credit Hours		16
Spring		
GEOS 405	Environmental Geosciences	3
Environmental theme elective ⁵		6
Environmental policy elective ⁸		3

Technical elective ⁶	3
Semester Credit Hours	15
Total Semester Credit Hours	120

¹ The graduation requirements include three hours of international and cultural diversity courses and three hours of cultural discourse courses. A course satisfying a Core category, a college/department requirement, or a free elective can be used to satisfy this requirement. See academic advisor.

² Choose one introductory course in the first semester and an additional one in the second semester of the sophomore year. Seek guidance from the academic advisor for Environmental Programs in Geosciences (ENVP) or your faculty mentor.

³ STAT 211 is recommended for the Coastal and Marine Environment Theme.

⁴ PHYS 206 and PHYS 226 is recommended for the Coastal and Marine Environment Theme.

⁵ Choose 18 hours of theme courses in your junior and senior years in consultation with your academic advisor or faculty mentor from the list below.

GEOS 484 can be taken for up to 6 credits and will normally be used as an adjustment to theme electives, but depending on the content of the internship credit, it can be applied as an adjustment to your technical electives or policy electives. Seek guidance from the ENVP academic advisor.

⁶ Other courses which match the Environmental Programs' technical electives definition will be allowed by adjustment. Guidance about technical electives (including the definition used by the Environmental Programs in Geosciences) can be found on the programs' website. Seek guidance about choices from the ENVP academic advisor or faculty mentor.

⁷ GEOG 390 is a required technical elective.

⁸ Seek guidance about choices from the ENVP academic advisor or faculty mentor.

Two courses in the degree plan must be writing intensive courses designated by the Environmental Programs in the schedule of classes. Also, international and cultural diversity electives (3 hours) and cultural discourse electives (3 hours) must be incorporated into the degree.

Code	Title	Semester Credit Hours
Environmental Theme Electives		
Climate Change		
GEOS 210	Climate Change	3
GEOS 444	The Science and Politics of Global Climate Change	3
PHYS 202	College Physics	4
Select the remaining courses from the following:		
AGSM 477	Air Pollution Control and Regulatory Compliance	3
ATMO 363	Introduction to Atmospheric Chemistry and Air Pollution	3
ATMO 463	Air Quality	3
GEOG 324	Global Climatic Regions	3
GEOG 360	Natural Hazards	3
GEOG 442/ GEOS 442	Past Climates	3

GEOL 306	Sedimentology and Stratigraphy	4
GEOL 451	Introduction to Geochemistry	3
GEOS 401	Polar Regions of the Earth: Science, Society and Discovery	3
GEOS 410	Global Change	3
GEOS 442/ GEOG 442	Past Climates	3
GEOS 443	Global Biogeochemical Cycles	3
GEOS 484	Internship	6
OCNG 310	Physical Oceanography	3
OCNG 340	Chemical Oceanography	3
Coastal and Marine Environments		
GEOG 370/ GEOS 370	Coastal Processes	3
or OCNG 411 or Global Oceanography		
Select the remaining courses from the following:		
BIOL 440	Marine Biology	4
GEOG 331	Geomorphology	3
GEOG 360	Natural Hazards	3
GEOL 306	Sedimentology and Stratigraphy	4
GEOL 440	Engineering Geology	3
GEOS 401	Polar Regions of the Earth: Science, Society and Discovery	3
GEOS 484	Internship	6
OCNG 310	Physical Oceanography	3
OCNG 320	Biological Oceanography	3
OCNG 330	Geological Oceanography	3
OCNG 340	Chemical Oceanography	3
OCNG 350	Marine Pollution	3
OCNG 404	Ocean Observing Systems	3
OCNG 425	Microbial Oceanography	3
OCNG 443	Oceanographic Field and Laboratory Methods	3
OCNG 453	Hydrothermal Vents and Mid-Ocean Ridges	3
RWFM 404	Aquatic Ecosystems	3
RWFM 418	Ecology of the Coastal Zone	3
WFSC 425	Marine Fisheries	3
Human Impact on the Environment		
GEOS 410	Global Change	3
GEOG 430	Environmental Justice	3
Select the remaining courses from the following:		
AGSM 477	Air Pollution Control and Regulatory Compliance	3
ARCH 421	Energy and Sustainable Architecture	3
ATMO 326	Environmental Atmospheric Science	3
ATMO 363	Introduction to Atmospheric Chemistry and Air Pollution	3
BESC 367	U.S. Environmental Regulations	3
ECCB 318/ RWFM 318	Coupled Social and Ecological Systems	3
ECCB 320	Ecosystem Restoration and Management	3

GEOG 309	Geography of Energy	3	RWFM 440	Wetland Delineation	3
GEOG 360	Natural Hazards	3	SCSC 301	Soil Science	4
GEOG 401	Political Geography	3	SCSC 309	Water in Soils and Plants	4
GEOL 301	Mineral Resources	3	SCSC 310	Soil Morphology and Interpretations	2
GEOL 404	Geology of Petroleum	3	SCSC 405	Soil and Water Microbiology	3
GEOL 410	Hydrogeology	3	SCSC 455	Environmental Soil and Water Science	3
GEOL 440	Engineering Geology	3	SCSC 458	Watershed, Water and Soil Quality Management	3
GEOL 451	Introduction to Geochemistry	3			
GEOS 401	Polar Regions of the Earth: Science, Society and Discovery	3	Biosphere		
GEOS 430	Global Science and Policy Making	3	GEOG 335	Pattern and Process in Biogeography	3
GEOS 431	Environmental Regulatory Compliance in Geoscience	3	OCNG 320	Biological Oceanography	3
GEOS 444	The Science and Politics of Global Climate Change	3	Select the remaining courses from the following:		
GEOS 484	Internship	6	BIOL 214	Genes, Ecology and Evolution	3
OCNG 350	Marine Pollution	3	BIOL 357 & BIOL 358	Ecology and Ecology Laboratory	4
RWFM 420	Ecology and Society	3	BESC 401	Bioenvironmental Microbiology	3
SENG 321	Safety Management Systems	3	BESC 402	Microbial Processes in Bioremediation	3
URPN 361	Urban Issues	3	ESSM 306	Plant Functional Ecology and Adaptation	3
Water			ECCB 307	Forest Protection	3
GEOG 434	Hydrology and Environment	4	ECCB 309	Forest Ecology	3
GEOL 410	Hydrogeology	3	ECCB 320	Ecosystem Restoration and Management	3
Select the remaining courses from the following:			ECCB 403	Population and Community Ecology	3
AGSM 335	Water and Soil Management	3	ECCB 416	Fire Ecology and Natural Resource Management	3
AGSM 337	Technology for Environmental and Natural Resource Engineering	3	ECCB 420	Ecological Restoration of Wetland and Riparian Systems	3
ATMO 251	Weather Observation and Analysis	3	ECCB 430	Advanced Restoration Ecology	3
ATMO 335	Atmospheric Thermodynamics	3	GENE 302 & GENE 312	Principles of Genetics and Comprehensive Genetics Laboratory	4
ATMO 352	Severe Weather and Mesoscale Forecasting	3	GENE 412	Population, Quantitative and Ecological Genetics	3
ATMO 443	Radar Meteorology	3	GEOG 435	Principles of Plant Geography	3
BESC 320	Water and the Bioenvironmental Sciences	3	GEOG 442/ GEOS 442	Past Climates	3
ECCB 301	Diversity and Evolution of Plants	3	GEOL 314	Paleontology and Geobiology	4
ECCB 420	Ecological Restoration of Wetland and Riparian Systems	3	GEOS 442/ GEOG 442	Past Climates	3
GEOG 324	Global Climatic Regions	3	GEOS 443	Global Biogeochemical Cycles	3
GEOG 331	Geomorphology	3	GEOS 484	Internship	6
GEOG 360	Natural Hazards	3	OCNG 425	Microbial Oceanography	3
GEOG 400	Arid Lands Geomorphology	3	OCNG 453	Hydrothermal Vents and Mid-Ocean Ridges	3
GEOL 412	Environmental Hydrogeology	3	RWFM 306	Wildlife and the Changing Environment	3
GEOL 440	Engineering Geology	3	RWFM 404	Aquatic Ecosystems	3
GEOL 451	Introduction to Geochemistry	3	RWFM 419	Wildlife Restoration	3
GEOS 401	Polar Regions of the Earth: Science, Society and Discovery	3	SCSC 301	Soil Science	4
GEOS 443	Global Biogeochemical Cycles	3	SCSC 405	Soil and Water Microbiology	3
GEOS 484	Internship	6			
OCNG 340	Chemical Oceanography	3			
OCNG 350	Marine Pollution	3			
OCNG 425	Microbial Oceanography	3			
RWFM 404	Aquatic Ecosystems	3			
RWFM 325	Watershed Analysis and Planning	3			

Code	Title	Semester Credit Hours	Code	Title	Semester Credit Hours
Technical Electives			OCNG 469	Python for Geosciences	3
AGSM 337	Technology for Environmental and Natural Resource Engineering	3	PHLT 335	Hazardous Materials	3
AGSM 360	Occupational Safety Management	3	PHYS 202	College Physics	4
ATMO 321	Computer Applications in the Atmospheric Sciences	3	PHYS 207	Electricity and Magnetism for Engineering and Science	3
ATMO 464	Laboratory Methods in Atmospheric Sciences	3	PHYS 227	Electricity and Magnetism Laboratory for the Sciences	1
BESC 403	Sampling and Environmental Monitoring	3	STAT 212	Principles of Statistics II	3
CHEM 227	Organic Chemistry I	3	STAT 335/ CSCE 320	Principles of Data Science	3
CHEM 228	Organic Chemistry II	3	STAT 407	Principles of Sample Surveys	3
CHEM 237	Organic Chemistry Laboratory	1	Code Title Semester Credit Hours		
CHEM 238	Organic Chemistry Laboratory	1	Environmental Policy Electives		
CHEM 383	Chemistry of Environmental Pollution	3	AGEC 350	Environmental and Natural Resource Economics	3
CHEM 483	Green Chemistry	3	AGEC 420	Food Security, Climate and Conflict	3
ECCB 308	Fundamentals of Environmental Decision-Making	3	AGEC 422	Land Economics	3
ECCB 406/ GEOG 462	Advanced GIS Analysis for Natural Resources Management	3	ANTH 461	Environmental Archaeology	3
ECCB 444	Remote Sensing of the Environment	3	ARCH 213	Sustainable Architecture	3
GEOG 312	Data Analysis in Geography	3	ARCH 421	Energy and Sustainable Architecture	3
GEOG 352/ GEO 352	GNSS in the Geosciences	3	BESC 311	International Perspectives on Environmental Issues	3
GEOG 361	Remote Sensing in Geosciences	4	BESC 367	U.S. Environmental Regulations	3
GEOG 380	Workshop in Environmental Studies	2-6	BESC 411	Environmental Health and Safety Compliance	3
GEOG 391	Geodatabases	4	ECCB 460/ RPTS 460	Nature, Values, and Protected Areas	3
GEOG 392	GIS Programming	4	ECON 202	Principles of Economics	3
GEOG 398	Interpretation of Aerial Photographs	3	ECON 203	Principles of Economics	3
GEOG 450	Field Geography	3	ECON 323	Microeconomic Theory	3
GEOG 461	Digital Image Processing in the Geosciences	4	GEOG 304	Economic Geography	3
GEOG 462/ ECCB 406	Advanced GIS Analysis for Natural Resources Management	3	GEOG 306	Introduction to Urban Geography	3
GEOG 467	Dynamic Modeling of Earth and Environmental Systems	4	GEOG 309	Geography of Energy	3
GEOG 475	Advanced Topics in GIS (Geographic Information Systems)	4	GEOG 401	Political Geography	3
GEOG 477	Terrain Analysis and Mapping	4	GEOG 406	Geographic Perspectives on Contemporary Urban Issues	3
GEOG 478	WebGIS	4	GEOG 430	Environmental Justice	3
GEO 306	Sedimentology and Stratigraphy	4	GEOS 430	Global Science and Policy Making	3
GEO 330	Geologic Field Trips	1-3	GEOS 444	The Science and Politics of Global Climate Change	3
GEOS 380	Workshop in Environmental Studies	3	PHIL 314	Environmental Ethics	3
GEOS 481	Seminar	1	PHLT 330	The Environment and Public Health	3
MATH 251	Engineering Mathematics III	3	POLS 347	Politics of Energy and the Environment	3
MATH 253	Engineering Mathematics III	4	POLS 440	Public Policies and Policymaking	3
MATH 308	Differential Equations	3	RELS 420	Religion and the Environment	3
OCNG 451	Mathematical Modeling of Ocean Climate	4	RWFM 375	Conservation of Natural Resources	3
OCNG 456	MATLAB Programming for Ocean Sciences	3	RWFM 470	Environmental Impact Assessment	3
			SOCI 328	Environmental Sociology	3
			SOCI 450/ MGMT 478	Social Entrepreneurship	3
			URPN 202	Building Better Cities	3

URPN 203	Smart Cities - Bit, Bots and Beyond	3
URPN 360	Issues in Environmental Quality	3
URPN 361	Urban Issues	3
URPN 371	Environmental Health Planning and Policy	3
URPN 460	Sustainable Communities	3
URPN 467	Land and Property Aspects of Sustainable Development	3